

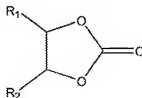
**Amendment to the Claims:**

Applicants respectfully request that the claims in the subject patent application be amended as follows. This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

Claim 1      (Previously presented)      A process for preparing Group II metal overbased sulfurized alkylphenols which comprises:

forming a reaction mixture by combining a sulfurized alkylphenol wherein the alkyl group contains a sufficient number of carbon atoms to render oil-soluble the resulting Group II metal overbased sulfurized alkylphenol, an alkanol containing about 6 to about 15 carbon atoms, a Group II metal oxide, hydroxide or C<sub>1</sub>-C<sub>8</sub> alkoxide, a C<sub>2</sub>-C<sub>10</sub> alkylene glycol and contacting with an alkylene carbonate selected from ethylene carbonate or a mono-alkyl or di-alkyl substituted ethylene carbonate, said alkylene carbonate having the following structure:

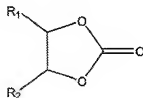


wherein R<sub>1</sub> and R<sub>2</sub> are independently hydrogen or alkyl containing one to three carbon atoms; and wherein the contacting is carried out for a time and at a temperature sufficient to form in situ carbon dioxide and alkylene glycol, or a reacting equivalent, to form a

product comprising a Group II earth metal overbased sulfurized alkylphenol.

- Claim 2 (Original) The process of claim 1 wherein the sulfurized alkylphenol is a Group II metal sulfurized alkylphenate.
- Claim 3 (Original) The process of claim 1 further comprising an oil-soluble Group II metal overbased natural or synthetic hydrocarbyl sulfonic acid, sulfonate, or mixtures thereof.
- Claim 4 (Original) The process of claim 1 wherein the alkylene carbonate is added to the reaction mixture over a time period of about 5 minutes to about 120 minutes.
- Claim 5 (Original) The process of claim 4 wherein the alkylene carbonate is added to the reaction mixture over a time period of about 15 minutes to about 90 minutes.
- Claim 6 (Original) The process of claim 5 wherein the alkylene carbonate is added to the reaction mixture over a time period of about 30 minutes to about 60 minutes.
- Claim 7 (Original) The process of claim 1 wherein the temperature is maintained below about 215°C.
- Claim 8 (Original) The process of claim 7 wherein the temperature is maintained between 150°C and 210°C.
- Claim 9 (Original) The process of claim 1 wherein the alkyl group of the alkylene carbonate is a methyl group.

- Claim 10 (Original) The process of claim 1 wherein the alkylene carbonate is ethylene carbonate.
- Claim 11 (Original) A process for preparing Group II metal overbased sulfurized alkylphenols which comprises the steps of:
- (a) forming a reaction mixture by combining a sulfurized alkylphenol wherein the alkyl group contains a sufficient number of carbon atoms to render oil-soluble the resulting Group II metal overbased sulfurized alkylphenol, an alkanol containing about 6 to about 15 carbon atoms, a Group II metal oxide, hydroxide or C<sub>1</sub>-C<sub>8</sub> alkoxide, and a C<sub>2</sub>-C<sub>10</sub> alkylene glycol; and
  - (b) contacting said reaction mixture with an alkylene carbonate selected from ethylene carbonate or a mono-alkyl or di-alkyl substituted ethylene carbonate, said alkylene carbonate having the following structure:

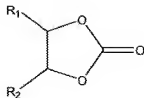


wherein R<sub>1</sub> and R<sub>2</sub> are independently hydrogen or alkyl containing one to three carbon atoms; and wherein the contacting is carried out for a time and at a temperature sufficient to form in situ carbon dioxide and alkylene glycol, or a reacting equivalent, to form a product comprising a Group II earth metal overbased sulfurized alkylphenol.

- Claim 12 (Original) The process of claim 11 wherein the sulfurized alkylphenol is a Group II metal sulfurized alkylphenate.
- Claim 13 (Original) The process of claim 11 further comprising in step (a) an oil-soluble Group II metal overbased natural or synthetic hydrocarbyl sulfonic acid, sulfonate, or mixtures thereof.
- Claim 14 (Original) The process of claim 11 wherein in step (b) the alkylene carbonate is added to the reaction mixture over a time period of about 5 minutes to about 120 minutes.
- Claim 15 (Original) The process of claim 14 wherein in step (b) the alkylene carbonate is added to the reaction mixture over a time period of about 15 minutes to about 90 minutes.
- Claim 16 (Original) The process of claim 15 wherein in step (b) the alkylene carbonate is added to the reaction mixture over a time period of about 30 minutes to about 60 minutes.
- Claim 17 (Original) The process of claim 11 wherein in step (b) the temperature is maintained below about 215°C.
- Claim 18 (Original) The process of claim 17 wherein in step (b) the temperature is maintained between 150°C and 210°C.
- Claim 19 (Original) The process of claim 11 wherein in step (b) the alkyl group of the alkylene carbonate is a methyl group.
- Claim 20 (Original) The process of claim 11 wherein in step (b) the alkylene carbonate is ethylene carbonate.

Claim 21 (Original) A process for preparing Group II metal overbased sulfurized alkylphenols which comprises the steps of:

- (a) forming a first reaction mixture by combining an alkylphenol wherein the alkyl group contains a sufficient number of carbon atoms to render oil-soluble the resulting Group II metal overbased sulfurized alkylphenol, an oil-soluble Group II metal overbased natural or synthetic hydrocarbyl sulfonic acid, sulfonate, or mixtures thereof, and an alkanol containing about 6 to about 15 carbon atoms, the temperature of said first reaction mixture being at least about 40°C;
- (b) contacting said first reaction mixture with a second reaction mixture comprising a Group II metal oxide, hydroxide or C<sub>1</sub>-C<sub>6</sub> alkoxide; a sulfurization agent and an inert hydrocarbon diluent at a temperature and for a time sufficient to effect sulfurization of the alkylphenol to form a third reaction mixture;
- (c) contacting said third reaction mixture with C<sub>2</sub>-C<sub>10</sub> alkylene glycol to form a fourth reaction mixture; and
- (d) contacting said fourth reaction mixture with an alkylene carbonate selected from ethylene carbonate or a mono-alkyl or di-alkyl substituted ethylene carbonate, said alkylene carbonate having the following structure:



wherein R<sub>1</sub> and R<sub>2</sub> are independently hydrogen or alkyl containing one to three carbon atoms; and wherein said contacting is carried out for a time and at a temperature sufficient to form in situ carbon dioxide and alkylene glycol, or a reacting equivalent, to form a product comprising a Group II earth metal overbased sulfurized alkylphenol.

- Claim 22 (Original) The process of claim 21 wherein in step (d) the alkylene carbonate is added to the fourth reaction mixture over a time period of about 5 minutes to about 120 minutes.
- Claim 23 (Original) The process of claim 22 wherein in step (d) the alkylene carbonate is added to the fourth reaction mixture over a time period of about 15 minutes to about 90 minutes.
- Claim 24 (Original) The process of claim 23 wherein in step (d) the alkylene carbonate is added to the fourth reaction mixture over a time period of about 30 minutes to about 60 minutes.
- Claim 25 (Original) The process of claim 21 wherein in step (d) the temperature is maintained below about 215°C.
- Claim 26 (Original) The process of claim 25 wherein in step (d) the temperature is maintained between 150°C and 210°C.

- Claim 27 (Original) The process of claim 21 wherein in step (d) the alkyl group of the alkylene carbonate is a methyl group.
- Claim 28 (Original) The process of claim 21 wherein in step (d) the alkylene carbonate is ethylene carbonate.
- Claim 29 (Original) The process of claim 21 wherein the ratio of the alkylene carbonate to the alkylphenol is 0.6 to 1.5 weight percent.
- Claim 30 (Original) The process of claim 21 wherein the charge mole ratio of the sulfur to the alkylphenol added in step (b) is about 1.0 to about 1.7.
- Claim 31 (Original) The process of claim 30 wherein the charge mole ratio of the sulfur to the alkylphenol added in step (b) is about 1.3 to about 1.5.
- Claim 32 (Original) The process of claim 21 wherein in step (c), after contacting the third reaction mixture with a C<sub>2</sub>-C<sub>10</sub> alkylene glycol, the temperature of the system is raised, if necessary, from that of step (b) to between about 120°C and about 190°C.
- Claim 33 (Original) The process of claim 21 wherein in step (c) the C<sub>2</sub>-C<sub>10</sub> alkylene glycol addition is conducted at from about 100°C to about 190°C.
- Claim 34 (Original) The process of claim 33 wherein in step (c) the C<sub>2</sub>-C<sub>10</sub> alkylene glycol addition is conducted at from 125°C to 165°C.
- Claim 35 (Original) The process of claim 21 further comprising:

(e) heating the fourth reaction mixture of step (d) under reduced pressure to remove a portion of unreacted C<sub>2</sub>-C<sub>10</sub> alkylene glycol and carbon dioxide.

Claim 36 (Original) The process of claim 35 wherein step (e) is preferably conducted at from about 175°C to about 210°C.

Claim 37 (Original) The process of claim 21 further comprising in step (a) or in step (b), or in both steps (a) and (b), the presence of a sulfurization catalyst, wherein the sulfurization catalyst is a hydrogen halide, an ammonium halide, a metal halide or 2-mercaptobenzothiozole.

Claim 38 (Original) The process of claim 37 wherein the sulfurization catalyst is a metal halide.

Claim 39 (Original) The process of claim 38 wherein the sulfurization catalyst is calcium chloride.

Claim 40 (Currently amended) The process of claim 21 wherein the alkyl group of the alkylphenol contains from about 25 to about 100 mole percent predominantly straight-chain alkyl groups containing from about 15 to about 35 carbon atoms and from about 75 to about 0 mole percent branched-chain alkyl groups containing from about 9 to about 18 carbon atoms.

Claim 41 (Previously presented) The process of claim 40 wherein the alkyl group of the alkylphenol contains from about 35 to about 100 mole percent straight-chain alkyl groups containing from about 15 to about 35 carbon atoms and from about 65 to about 0 mole



percent branched-chain alkyl groups containing from about 9 to about 18 carbon atoms.

Claim 42 (Previously presented) The process of claim 41 wherein the alkyl group of the alkylphenol contains from about 40 to about 70 mole percent straight-chain alkyl groups containing from about 15 to about 35 carbon atoms and from about 60 to about 30 mole percent branched-chain alkyl groups containing from about 9 to about 18 carbon atoms.

Claim 43 (Previously presented) The process of claim 42 wherein the alkyl group of the alkylphenol contains approximately 50 mole percent straight-chain alkyl groups containing from about 15 to about 35 carbon atoms and approximately 50 mole percent branched-chain alkyl groups containing from about 9 to about 18 carbon atoms.

Claim 44 (Original) The process of claim 21 wherein the alkyl group of the alkylphenol is attached predominantly at the para position of the phenol ring.

Claim 45 (Original) The process of claim 44 wherein the alkylphenol containing the para attachment of the alkyl group is from about 70 to about 95 weight percent of the total alkylphenol.

Claim 46 (Original) The process of claim 45 wherein the alkylphenol containing the para attachment of the alkyl group is from about 80 to about 95 weight percent of the total alkylphenol.

- Claim 47 (Original) The process of claim 21 wherein the alkanol contains about 8 to about 13 carbon atoms and the C<sub>2</sub>-C<sub>10</sub> alkylene glycol is ethylene glycol.
- Claim 48 (Original) The process of claim 47 wherein the alkanol is isodecyl alcohol.
- Claim 49 (Original) The process of claim 21 wherein the hydrocarbyl group of the oil-soluble Group II metal overbased natural or synthetic hydrocarbyl sulfonic acid, sulfonate, or mixtures thereof, is an alkyl aromatic group.
- Claim 50 (Original) The process of claim 49 wherein the alkyl group of the alkyl aromatic group contains from about 6 carbon atoms to about 60 carbon atoms.
- Claim 51 (Original) The process of claim 50 wherein the alkyl group of the alkyl aromatic group contains from about 10 carbon atoms to about 40 carbon atoms.
- Claim 52 (Original) The process of claim 51 wherein the alkyl group of the alkyl aromatic group contains from about 20 carbon atoms to about 28 carbon atoms.
- Claim 53 (Original) The process of claim 21 wherein the Group II metal oxide, hydroxide or C<sub>1</sub>-C<sub>6</sub> alkoxide is selected from the group consisting of calcium, barium, and magnesium oxide, hydroxide or C<sub>1</sub>-C<sub>6</sub> alkoxide and mixtures thereof.
- Claim 54 (Original) The process of claim 53 wherein the Group II metal oxide, hydroxide or C<sub>1</sub>-C<sub>6</sub> alkoxide is calcium hydroxide.

- Claim 55 (Original) The process of claim 54 wherein the Group II metal oxide, hydroxide or C<sub>1</sub>-C<sub>6</sub> alkoxide is Dolomite comprising Ca(OH)<sub>2</sub>.Mg(OH)<sub>2</sub>.
- Claim 56 (Original) A product made by the process of claim 1.
- Claim 57 (Original) A product made by the process of claim 11.
- Claim 58 (Original) A product made by the process of claim 21.
- Claim 59 (Original) A product made by the process of claim 35.
- Claim 60 (Original) A product made by the process of claim 37.
- Claim 61 (Previously presented) A detergent-dispersant additive comprising Group II metal overbased sulfurized alkylphenols, said additive being characterized by the following properties:
- (a) a color of 3.5 or lower, as measured using ASTM Test No. D 6045; and
  - (b) an increased hydrolytic stability as measured by a modified ASTM Test No. 2619 wherein the TBN of the Group II metal overbased sulfurized alkylphenols decreases less than 10 percent after dilution of the Group II metal overbased sulfurized alkylphenols in finished marine oil to a TBN of 10 and the addition of 2.0 percent water and after 6 days at 80°C.
- Claim 62 (Previously presented) The detergent-dispersant additive of claim 61 wherein the TBN of the Group II metal overbased

sulfurized alkylphenols decreases less than 8 percent after dilution of the Group II metal overbased sulfurized alkylphenols in finished marine oil to a TBN of 8 and the addition of 2.0 percent water and after 6 days at 80°C.

Claims 63-66            (Cancelled)